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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/629,014	07/29/2003	Guy M. Cohen	YOR920000173US2	7623
28211	7590	09/23/2004	EXAMINER	
FREDERICK W. GIBB, III MCGINN & GIBB, PLLC 2568-A RIVA ROAD SUITE 304 ANNAPOLIS, MD 21401			GEBREMARIAM, SAMUEL A	
			ART UNIT	PAPER NUMBER
			2811	

DATE MAILED: 09/23/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b> 10/629,014	<b>Applicant(s)</b> COHEN ET AL. 	
	<b>Examiner</b> Samuel A Gebremariam	<b>Art Unit</b> 2811	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 23 August 2004.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 24-38 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 24-38 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
     Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
     Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## DETAILED ACTION

### ***Claim Rejections - 35 USC § 102***

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 24-29, 31-35, and 37-38 are rejected under 35 U.S.C. 102(b) as anticipated by Lee et al. (Super Self-aligned Double-Gate (SSDG) MOSFETS Utilizing Oxidation Rate Difference and Selective Epitaxy, IEEE, 1999, pp71-74).

Regarding claim 24, Lee teaches (fig. 1) an integrated circuit comprising: a channel region fig. 1c, page 71 1<sup>st</sup> paragraph); a top gate (TG) above the channel region; bottom gate (BG) below the channel region; and spacers (fig. 1e) adjacent the top gate and the bottom gate, wherein the spacers comprise a material that is independent of the material of the top gate and the bottom gate (the gate material of both the top and bottom gates is doped polysilicon while the spacer is silicon oxide. Therefore the spacer material is independent of the top gate material).

Regarding claim 25, Lee teaches the entire claimed structure of claim 1 above including the top gate and the bottom gate comprise the same material (fig. 1c and fabrication steps).

Regarding claim 26, Lee teaches the entire claimed structure of claim 24 above including the top gate and the bottom gate comprise an insulator.

The limitation that spacer is deposited is not given patentable weight, because it is considered to be a product-by-process claim. "[E]ven though product-by process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process." *In re Thorpe*, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985).

Regarding claim 27, Lee teaches the entire claimed structure of claim 24 above including source and drain regions adjacent the top gate and the bottom gate, wherein the spacers separate the source and drain regions from the top gate and the bottom gate (fig. 1e and 1f).

Regarding claim 28, Lee teaches the entire claimed structure of claim 24 above including the spacers comprise upper spacers and lower spacers separated by the channel (fig. 1e).

Regarding claim 29, Lee teaches the entire claimed structure of claim 24 above including the spacers comprise lower spacers in direct contact with the top gate, wherein the spacers comprise lower spacers in direct contact with a lower section of the top gate and upper spacers in direct contact with an upper section of the top gate (fig. 1e, Lee's top gate is considered to have lower spacers that are in direct contact with the lower section of the top gate and upper spacers that are in direct contact with the upper section of the top gate).

Regarding claim 31, Lee teaches the entire claimed structure of claim 29 above including source and drain regions adjacent the top gate wherein the lower spacers are adjacent the source and drain regions and the upper spacers are at a level above the source and drain regions (fig. 1e).

Regarding claim 32, Lee teaches the entire claimed structure of claim 29 above including the upper spacers and the lower spacers are above the channel region.

Regarding claim 33, Lee teaches the entire claimed structure of claim 29 above including third spacers adjacent the bottom gate.

Regarding claim 34, Lee teaches the entire claimed structure of claim 29 above including source and drain regions adjacent the lower section of the top gate.

Regarding claim 35, Lee teaches the entire claimed structure of claims 29 and 32-34 above including silicide regions along upper portions of the source and drain regions, wherein the silicide regions are adjacent a point where the upper spacers meet the lower spacers (see fig. 1e).

Regarding claims 37 and 38, Lee teaches the entire claimed structure of claims 33 and 35 above including the upper spacers and the lower spacers are above the channel region (fig. 1e).

***Allowable Subject Matter***

3. Claims 30 and 36 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

***Response to Arguments***

4. Applicant's arguments filed 8/23/04 have been fully considered but they are not persuasive. Applicant argues that since Lee teaches the spacer structure by oxidizing the gate structure, Lee does not teach spacers comprising a material that is independent of the material of the top gate. Independent claim 24, as recited only states "spacers comprise a material that is independent of the material of said top gate and said bottom gate". Since the physical properties such as conductivity of spacer structures are different than gate structures, the materials used to form gate structures are independent from the spacer structures. The fact that Lee forms the spacer structures by oxidizing the gate material is not an issue at present because applicant is not claiming the process of making the spacer structures.

Furthermore applicant argues that since the inventive process of forming the spacers 307 and 1200, results in distinct upper and lower spacers adjacent the top gate. Since the claim only states spacers comprising lower spacers in direct contact with a lower section of the top gate and upper spacers in direct contact with an upper section of the top gate, Lee's fig. 1e can be interpreted as having top gate that is considered to have lower spacers that are in direct contact with the lower section of the top gate and upper spacers that are in direct contact with the upper section of the top gate.


***Conclusion***

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Samuel A Gebremariam whose telephone number is (571)-272-1653. The examiner can normally be reached on 8:00am-4:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Eddie Lee can be reached on (571) 272-1732. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

SAG  
September 17, 2004



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